

III. REMARKS

A. Rejection Under 35 U.S.C. §103

Claims 1–6, 8–13, 15–19 and 22–31 are rejected under 35 U.S.C. §103 as being unpatentable over United States Patent No. 5,569,461 to Andrews (“Andrews”), in view of Scalbert et al. (“Antimicrobial Properties of Tannins,” *Phytochemistry* Vol. 30, No. 12, pp. 3875–3883, 1991), Varga, J. (Derwent ACC-NO 1976-72203X (*see* Abstract) (“Varga Abstract”), United States Patent No. 4,110,430 to Hopp et al. (“Hopp et al.”), United States Patent No. 6,033,705 to Isaacs (“Isaacs”) and United States Patent No. 6,284,259 to Beerse et al. (“Beerse et al.”).

1. Examiner's Reasons in Support of the Rejection

The Examiner's reasons in support of the rejection are as follows:

[Applicant] claims a method for disinfection of air to reduce the concentration of germs comprising the distributing or atomizing of an antimicrobial composition wherein the antimicrobial composition is free from ethanol and isopropanol and wherein the antimicrobial composition comprises propylene glycol, tannins, lactic acid, benzyl alcohol and further comprises hydrocinnamic alcohol, additional GRAS flavoring agents such as essential oils (*see, e.g. claim 10*) and an emulsifier (*see, e.g. claim 17*).

Andrews teaches an antimicrobial composition comprising propylene glycol and lactic acid for disinfecting. Andrews does not teach the other claimed active ingredient such as tannins, a benzyl alcohol, a hydrocinnamic alcohol, additional GRAS flavoring agents such as essential oils and an emulsifier contained within its antimicrobial composition.

Scalbert et al. beneficially teach tannins to have antimicrobial properties.

Varga J beneficially [teaches] (*see, e.g. abstract*) a benzyl alcohol to have antimicrobial and/or antibacterial properties.

Hopp et al. beneficially teach (*see, e.g., column 1, lines 21–29 and lines 60–65*) a hydrocinnamic alcohol to have antimicrobial and/or antibacterial properties.

Isaacs beneficially [teaches] (*see, e.g., column 10, lines 23–29*) an emulsifier may be added to a compound to enhance its antimicrobial effect.

Beerse et al. beneficially teach (*see, e.g. column 9, lines 19–39*) essential oils to have antimicrobial and/or antibacterial properties.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Andrews' antimicrobial composition to include the other claimed active ingredients beneficially taught by Scalbert, Varga J, Hopp, Isaacs and Beerse because the combined above references would create an improved claimed antimicrobial composition wherein the improved claimed composition would intrinsically disinfect the air when reducing the concentration of microbial and/or bacteria germs within the air. Furthermore, the adjustment of other conventional working conditions (*e.g. the claimed concentrations of the antimicrobial composition within the air, the type of antimicrobial system and/or spray design and the substitution of known bacterial for one another to be treated and/or reduced*), is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan.

Accordingly, the claimed invention was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, especially in the absence of evidence to the contrary.

(Action, page 3, line 23 to page 5, line 10).

2. Comparison of Claimed Invention and Prior Art

Independent claims 1 and 22 are directed to a method and composition for the disinfection of air comprising the distributing or atomizing of an antimicrobial composition that can be added to the air to achieve a dosage of from 0.001 to 1 ml per cubic meter of air per hour. The claims also are directed to the achievement of a permanent concentration of from 5 to 10 ptb (parts per billion) of the antimicrobial composition in the air. The antimicrobial composition is free from ethanol and isopropanol and comprises propylene glycol, tannins and lactic acid. Independent claims 23, 25 and 27 are also directed to the above-referenced method, except that disinfection of air is further defined as reducing the concentration of germs selected from gram-positive bacteria, gram-negative bacteria, molds, spore-formers, viruses, bacillus subtilis, pseudomona fluorescens, staphylococcus aureus, aspergillus niger, hepatitis B and bacillus anthracis. The remaining claims 2–6, 8–13, 15–19, 24, 26 and 28–31 are dependent upon the above-referenced independent claims or are dependent upon a claim that in turn is dependent upon one of the above-referenced independent claims.

Accordingly, Applicant's claimed method utilizes an antimicrobial composition in extremely low concentrations in air, namely, 5 to 10 parts per billion. None of the prior art references relied on by the Examiner discloses, exemplifies or even suggests to one of ordinary skill in the art a method using antimicrobial compositions in such low concentrations.

Andrews is directed to antimicrobial systems comprising certain propylene glycol mono fatty acid esters in combination with both acidic chelating agents and edible saturated fatty acids in the presence of a propylene glycol vehicle. (Column 2, lines 12–20). Andrews does not exemplify or otherwise disclose to one of ordinary skill in the art the concentrations in air in which the Andrews antimicrobial systems should be employed.

Scalbert reviews data on tannin toxicity against fungi, bacteria and yeasts and compared to toxicity of related lower molecular weight phenols (Abstract). Examples of tannin toxicity disclosed in Scalbert involve concentrations of tannin that are higher by many magnitudes than the concentration disclosed in Applicant's claims. In Scalbert, tannin concentrations vary from 0.063 gram per liter to 100 grams per liter. (See page 3878, lines 29–44 and page 3880, last paragraph). A concentration of 0.063 grams per liter, which is described in Scalbert as "a low tannin concentration" is equivalent to a concentration of about 1 part per 16,000 parts of composition. In contrast, Applicant's claims are limited to concentrations in air of from 5 to 10 parts per billion, or about 6,000 times lower than the lowest tannin concentration disclosed in Scalbert. From the range of concentrations given for tannins in Scalbert and the expression of concentration in grams per liter, it appears that the Scalbert composition is in liquid form and not intended to be used in air. As noted above, Scalbert does not disclose any concentrations in air at which the Scalbert composition is intended to exist, let alone the concentrations of antimicrobial composition in the air set forth in Applicant's claimed method.

The Varga Abstract discloses treatment of the surface of a doormat with the combination of methylparaban, propylparaban and benzyl alcohol to disinfect it and destroy bacteria, fungi, and viruses deposited on the mat. It appears that the Varga composition is in liquid form and is not intended to be present in the air. Varga does not disclose any concentrations in air at which the Varga composition is intended to exist, let alone the concentrations of antimicrobial composition in the air set forth in Applicant's claimed method.

Hopp et al. is directed to a germ-inhibiting, microbicidal or deodorizing composition comprising p-isopropyl-and/or p-tert.butyl-alpha-methyl hydrocinnamic alcohol, together with a carrier or dilutant (Abstract). The Hopp et al. composition appears to be in the form of a liquid or spray. Hopp et al. discloses that "the germ-inhibiting microbicidal properties of the hydrocinnamic alcohols to be used according to the invention become apparent when these compounds are applied in an amount of at least 0.001 mg per cm² of skin. (Column 1 lines 61–64). Such concentrations appear to be several orders of magnitude greater than the concentration of antimicrobial composition in air set forth in Applicant's claimed method. No other concentrations of the composition are disclosed.

The final two references, Isaacs and Beerse et al. relate to treatments of a surface with an antimicrobial liquid. Isaacs is directed to a process for inhibiting microbial growth on a surface of an edible foodstuff, which comprises applying to the surface a defined compound selected from a group consisting of certain fatty acids and derivatives of fatty acids and fatty alcohols (Abstract). Beerse et al. relates to an antimicrobial wipe comprising a porous or absorbent sheet impregnated with an antimicrobial cleansing composition, wherein the antimicrobial cleansing composition comprises from about 0.001% to about 5.0% by weight of the antimicrobial cleansing composition of an antimicrobial active. Neither Isaacs nor Beerse et al. discloses a method which involves the achievement of a concentration in air of from 5 to 10 parts per billion of the antimicrobial composition.

3. No prima facie case of obviousness

Under Section 2142 of the Manual of Patent Examining Procedure, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claimed limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

No *prima facie* case of obviousness has been made because the prior art references, when combined, do not teach or suggest all of Applicant's claimed limitations, in particular, a concentration in air of from five to ten parts per billion of the antimicrobial composition. Instead, the prior art relied on by the Examiner employs concentrations of compositions that are many orders of magnitude greater than Applicant's claimed composition. Accordingly, the prior art does not satisfy the criteria that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art.

The Examiner suggests that the modification of the prior art is merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. In fact, the prior art relied on by the Examiner cannot be so modified. As noted

above, Scalbert discloses a range of concentrations of tannins over 6,000 times the concentration of the composition set forth in Applicant's claims. The Scalbert article focuses on tannin toxicity and the concentration of tannins required to achieve toxicity for fungi, bacteria and yeasts. The Scalbert article discloses that even at one hundred grams per liter, certain species of penicillium and aspergillus still achieve good growth (p. 3880). This disclosure suggests that the much lower concentrations of tannins set forth in Applicant's claims would be less effective, not more. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

In addition, as noted above, Scalbert and the other references are not directed to a method using antimicrobial compositions in very low concentrations in air. Indeed, the concentrations proposed in Scalbert are not applicable to a method of disinfection in air. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).


For the reasons set forth above, one skilled in the art cannot derive from the combination of references relied on by the Examiner how to obtain Applicant's claimed method. Nor are the limitations as to air concentration in Applicant's claimed method merely a matter of judicious selection and routine observation which is well within the purview of the skilled artisan. Instead, the discovery of an antimicrobial composition that can be employed at the very low concentration levels set forth in Applicant's claims is itself patentable absent the disclosure of that feature of the invention in the art. Accordingly, the rejection of claims 1-6, 8-13, 15-19 and 22-31 under 35 U.S.C. §103 is untenable and should be withdrawn for the reasons set forth above.

IV. Conclusion

It is believed that the above Remarks constitute a complete response under 37 CFR §1.111 and that all bases of rejection in the Examiner's Action have been adequately rebutted or overcome. A Notice of Allowance in the next Office Action is, therefore, respectfully requested. The Examiner is requested to telephone the undersigned attorney if any matter that can be expected to be resolved in a telephone interview is believed to impede the allowance of pending claims 1-6, 8-13, 15-19 and 22-31 of United States Patent Application Serial No. 10/019,240.

Respectfully submitted,

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